

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of load-balancing a network comprising the steps of:

establishing a primary LNS, a peer LNS and a LAC, wherein said primary LNS includes state information;

coupling the primary LNS, the peer LNS, and the LAC to a network;

transmitting first information from ~~a said~~ CPE to said LAC;

establishing a first tunnel between said LAC and said primary LNS and transmitting said first information through said tunnel;

comparing an LNS overload parameter to an LNS overload threshold and responsively determining that ~~whether~~ said primary LNS is overloaded if said LNS overload parameter exceeds said LNS overload threshold;

offloading said state information directly from said primary LNS to said peer LNS via said network;

in response to ~~said determining that said primary LNS is overloaded~~ step, establishing a second tunnel from said LAC to said peer LNS using said state information; and

transmitting second information from said CPE to said LAC and through said second tunnel.

2. (Currently amended) The method of claim 1, further comprising the ~~further~~ step of:

requesting a switchover from said ~~a~~ primary LNS to said ~~a~~ peer LNS.

3. (Original) The method of claim 1 comprising the further step of:
detecting whether the primary LNS is inoperative.

4. (Currently amended) A method of providing high availability in a network comprising the steps of:

establishing a primary LNS, a peer LNS and a LAC, said primary LNS including state information;

coupling the primary LNS and the peer LNS to a network;

transmitting first information from a said CPE to said LAC;

establishing a first tunnel between said LAC and said primary LNS and transmitting said first information through said first tunnel via one or more communication sessions;

comparing an LNS overload parameter to an LNS overload threshold and responsively determining that ~~whether~~ said primary LNS is overloaded if said LNS overload parameter exceeds said LNS overload threshold; functioning;

directly offloading state information from said primary LNS to said ~~the~~ peer LNS;

in response to said determining step, (i) establishing a second tunnel from said CPE to said peer LNS using said state information, and (ii) performing a switchover of some of said one or more communication sessions to said peer LNS; and

transmitting second information from said CPE to said LAC; and

transmitting said second information through said second tunnel via said some of said one or more communication sessions.

5. (Currently amended) A system for achieving load balancing comprising:

a first network;

a LAC coupled to said first network;

a primary LNS, said primary LNS including state information and a peer LNS, said primary LNS and said peer LNS being coupled to said first network; and

a CPE coupled to said LAC;

wherein said primary LNS transfers state information directly to said peer LNS; ~~and~~

wherein said primary LNS and said LAC establish one or more communication sessions between said primary LNS and said LAC,

wherein said primary LNS detects that said primary LNS is overloaded, and responsively sends said LAC a request to switchover to said peer LNS, and ~~upon the detection of an overload condition~~

wherein said request directs said LAC to switch some of said one or more communication sessions between said primary LNS and said LAC to between said peer LNS and said LAC.

6. (Original) The system of claim 5 wherein said primary LNS sends a switchover request to said LAC.

7. (Original) The system of claim 6 wherein said LAC sends a switchover reply in response to receiving said switchover request.

8. (Original) The system of claim 5 wherein said LAC determines whether said primary LNS is operative.

9. (Currently amended) A system comprising:

a primary LNS, said primary LNS including (i) state information, (ii) an LNS overload parameter, (iii) an LNS overload threshold, and (iv) program code for comparing said LNS overload parameter to said LNS overload threshold and for detecting that said primary LNS is overloaded if said LNS overload parameter exceeds said LNS overload threshold;

a peer LNS;

a network, said primary LNS and said peer LNS coupled to said network;~~and~~

means for offloading said state information directly from said primary LNS to said peer LNS;

means for requesting a switchover of communication sessions to said peer LNS if said primary LNS is overloaded, wherein said communication sessions are sessions selected from the group consisting of (i) new communication sessions, (ii) existing communication sessions to said primary LNS, and (iii) new communication sessions and existing communication sessions to said primary LNS; and

means for switching over said communication sessions.

10. (Currently amended) A system comprising:

a access concentrator;

a primary network server, said primary network server having associated state information;

a peer network server; and

a network coupled to said primary network server, said access concentrator, and said peer network server,

wherein said primary network server directly downloads state information to said peer network server,

wherein said primary network server and said access concentrator establish a first set of communication sessions between said primary network server and said access concentrator,

wherein said primary network server detects that said primary network server is overloaded and responsively requests said access concentrator to switchover some of the first set of communication sessions to the peer network server, and thereafter said access concentrator responsively switches some of the first set of communication sessions to said peer network server, and

wherein said access concentrator uses said state information to switch said some of the first set of communication sessions.

11. (Original) The system of claim 10 wherein said primary network server requests the access concentrator that said peer network server become activated.

12. (Original) The system of claim 11 wherein said access concentrator determines whether said primary network server is inoperative.

13. (Original) The system of claim 10 further comprising CPE, wherein said CPE is coupled to said access concentrator.

14. (Original) The system of claim 10 further including a first tunnel between said access concentrator and said primary server, said tunnel carrying information.

15. (New) The method of claim 1,
wherein said LNS overload parameter is a parameter selected from the group consisting of (i) a number of LNS connections, (ii) a CPU usage value, and (iii) a memory usage value,
wherein (i) if said LNS overload parameter is said number of LNS connections, then said LNS overload threshold is a number of LNS connections that indicates said primary LNS is overloaded, (ii) if said LNS overload parameter is said CPU usage value, then said LNS overload threshold is a CPU usage value that indicates said primary LNS is overloaded, and (iii) if said LNS overload parameter is said memory usage value, then said LNS overload threshold is a memory usage value that indicates said primary LNS is overloaded.

16. (New) The method of claim 2, wherein said switchover involves switching all sessions selected from the group of: (i) new sessions, (ii) some sessions, and (iii) all sessions.

17. (New) The method of claim 4, wherein said second set of communication sessions includes sessions selected from the group consisting of: (i) new sessions, (ii) some of the first set of communication sessions, and (iii) new sessions and the first set of communication sessions.

18. (New) The method of claim 4, further comprising:

buffering said second information in said LAC until said second tunnel is established and said switchover is performed.

19. (New) The system of claim 5, wherein said request further directs said LAC to switch new communication sessions directed towards said primary LNS to said peer LNS.

20. (New) The method of claim 9,
wherein said LNS overload parameter is a parameter selected from the group consisting of (i) a number of LNS connections, (ii) a CPU usage value, and (iii) a memory usage value,
wherein (i) if said LNS overload parameter is said number of LNS connections, then said LNS overload threshold is a number of LNS connections that indicates said primary LNS is overloaded, (ii) if said LNS overload parameter is said CPU usage value, then said LNS overload threshold is a CPU usage value that indicates said primary LNS is overloaded, and (iii) if said LNS overload parameter is said memory usage value, then said LNS overload threshold is a memory usage value that indicates said primary LNS is overloaded.